

What is claimed is :

1. A front derailleur for a bicycle, said bicycle comprising a chain, a chainwheel, a control cable and a seat tube, said front derailleur comprising:

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a frame bracket having a pair of lugs disposed at a side thereof close to the chainwheel for connecting with the seat tube ;

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a chain guide comprising a guide plate overstriding said chain and a pivot joint formed at an opposite side of said guide plate;

a linkage rod having one of its ends pivotally connected to said lug, and the other end thereof pivotally connected to said pivot joint; and

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an actuating arm pivotally connected to said frame bracket using a shaft installed with a return spring, wherein one end of the actuating arm is pivotally connecting to said pivot joint of said chain guide, and a cable connector is installed on the other end thereof for connecting to the control cable;

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wherein, the chain guide is drivenable by the control cable for operating between at least a highest speed mode and a lowest speed mode;

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wherein, said frame bracket, chain guide, linkage rod and actuating arm are so positioned in such a manner that, while said chain guide of the front derailleur is operating in the highest speed mode, said linkage rod is at a position substantially parallel to said seat tube, so that a restoring force provided by said return spring is equal to an active component force for actually shifting said chain, that is, the restoring force can be utilized fully for down-shifting.

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2. The front derailleur for a bicycle of claim 1, wherein said actuating

- arm is pivotally connected to said frame bracket through two shaft holes, which are located respectively at one side of said lug of said frame bracket and at a middle section of said actuating arm, using said shaft, furthermore, said actuating arm further comprises a pivot joint plate formed at one end of said actuating arm for pivotally connecting to said pivot joint of said chain guide, and said cable connector installed on the other end thereof which is composed of cover plate and screw for connecting to said control cable.
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- 10 3. The front derailleur for a bicycle of claim 1, wherein, when said linkage rod is not exactly parallel to said seat tube, but with a $\pm 10^\circ$ difference caused by the use of difference constructing parts, and the restoring force of the return spring can still be utilized fully during down-shifting in high speed mode.
- 15 4. A front derailleur for a bicycle, said bicycle comprising a chain, a chainwheel, a control cable and a seat tube, said front derailleur comprising:
- a frame bracket having a pair of lugs disposed at a side thereof close to the chainwheel for connecting with the seat tube ;
- 20 a chain guide comprising a guide plate overstriding said chain and a pivot joint formed at an opposite side of said guide plate;
- a linkage rod having one of its end pivotally connected to said lug, and the other end thereof pivotally connected to said pivot joint;
- 25 an actuating arm 2 pivotally connected to said frame bracket using a shaft, wherein one end of the actuating rod is pivotally connecting to said pivot joint of said chain guide, and a cable connector is installed on the other end thereof for connecting to the control cable; and
- 30 an extension spring having one end thereof connected to said lug where connecting with said linkage rod, and the other

end thereof connected to said chain guide via a connecting hole located at the upper inward side of said guide plate.

wherein, the chain guide is drivenable by the control cable for operating between at least a highest speed mode and a lowest speed mode;

wherein, said frame bracket, chain guide, linkage rod and actuating arm are so positioned in such a manner that, while said chain guide of the front derailleur is operating in the highest speed mode, said linkage rod is at a position substantially parallel to said seat tube, so that a restoring force provided by said return spring is equal to an active component force for actually shifting said chain, that is, the restoring force can be utilized fully for down-shifting.

5. The front derailleur for a bicycle of claim 4, wherein said actuating arm is pivotally connected to said frame bracket through two shaft holes, which are located respectively at one side of said lug of said frame bracket and at a middle section of said actuating arm, using said shaft, furthermore, said actuating arm further comprises a pivot joint plate formed at one end of said actuating arm for pivotally connecting to said pivot joint of said chain guide, and said cable connector installed on the other end thereof which is composed of cover plate and screw for connecting to said control cable.

6. The front derailleur for a bicycle of claim 4, wherein, when said linkage rod is not exactly parallel to said seat tube, but with a $\pm 10^\circ$ difference caused by the use of difference constructing parts, and the restoring force of the return spring can still be utilized fully during down-shifting in high speed mode.